BINARY

engineered by Snap av

OWNER'S MANUAL

>> BINARY™ HD MATRIX SWITCHER

B-100-HDMATRIX-4X4 / B-100-HDMATRIX-8X8

IMPORTANT SAFETY INSTRUCTIONS

WARNING: To reduce the risk of fire or electric shock, do not expose this apparatus in or near rain or moisture.

1. Read and keep these instructions for future reference.

2. Do not use this apparatus near water.

3. Clean only with a dry cloth.

4. Do not block any ventilation openings. Install according to manufacturer's instructions.

5. Do not install near any heat sources such as radiators, heat registers, stoves or other apparatus (Including amplifiers) that produce heat.

6. Do not override the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades - one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

7. Protect the power cord from being walked on or pinched particularly at plug, convenience receptacles, and the point where it exits from the apparatus.

8. Only use attachments/accessories specified by the manufacturer.

9. To completely disconnect this equipment from the AC mains, disconnect the power supply cord plug from the AC receptacle.

10. This is CLASS II apparatus with double insulation, and no protective earth provided.

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of un-insulated dangerous voltage within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

TABLE OF CONTENTS

1 OVERVIEW 4
1.1 Features 4
1.2 PACKAGE CONTENTS 4
2 FRONT AND REAR PANEL 5
2.1 Front Panel B-100-HDMatrix-4x4 5
2.2 Front Panel B-100-HDMatrix-8x8 5
2.3 Rear Panel B-100-HDMATRIX-4x4 6
2.4 Rear Panel B-100-HDMATRIX-8x8 6
3 INSTALLATION 7
3.1 Installation Considerations 7
3.1.1 Rack Installation 7
3.2 Connections 8
3.2.1 Basic Connections 8
3.3 Control Ports 9
3.3.2 IR Receiver Connection 9
3.3.2.1 Stereo to Mono IR Adaptor 9
3.3.2.2 Custom Cable Construction 9
3.3.3 RS-232 DB9 Serial Connection 10
4 EDID CONFIGURATION 11
4.1 Basic EDID Configuration 11
4.2 Advanced EDID Configuration 12
4.2.1 Embedded EDIDs Defaults 12
4.2.1.1 Setting EDID for Single Input 13
4.2.1.2 Setting EDID for All Inputs 13
4.2.2 Learning EDID 14
4.2.2.1 Learning EDID to All Inputs 14
4.3 EDID Status 15
5 ADVANCED CONFIGURATION 15
5.1 PC Configuration Other Settings 15
5.1.1 IR Receiver Active 15
5.1.2 Front Panel Power Button Active 15
5.1.3 HDMI Input EQ Setting 15
6 OPERATION AND CONTROL 16
6.1 IR Remote 16
6.1.1 Route Inputs to Outputs 16
6.1.2 Turn Off (Mute) Outputs 17
6.1.4 Resetting to Factory Defaults 17
7. SPECIFICATIONS 18
8. WARRANTY 19

1. OVERVIEW

Welcome to Binary™ - This product is engineered to provide years of exceptional reliability. Binary™ is one of the most highly regarded brands available today and stands committed to providing customers with the highest degree of quality and service in the industry.

The B-100-HDMATRIX-4x4 and B-100-HDMATRIX-8x8 are state-of-the-art HDMI switchers providing true Matrix Routing for HDMI signals. With features such as HDMI 1.4a 3D support, sophisticated EDID handling, IR, RS232 and Ethernet (8x8 only) control, they are ideal for residential and commercial media distribution systems.

1.1 FEATURES

· (4) HDMI Sources by (4) HDMI Outputs {B-100-HDMATRIX-4x4}
· (8) HDMI Sources by (8) HDMI Outputs {B-100-HDMATRIX-8x8}
· Outputs can show the same or different sources simultaneously
· Video resolutions up to 1080p/60 with 36bit color
· Digital Audio up to 7.1 Channels
  — Dolby TrueHD
  — Dolby Digital Plus
  — DTS-HD Master
  — DTS-HD
  — Dolby Digital EX
  — DTS-ES
  — Dolby Digital
  — DTS
  — LPCM
· Support for HDMI 1.4a 3D formats
· Sophisticated EDID handling including Embedded, Learned and Auto modes
· HDMI or DVI with adapter (not included)
· IR Control from integrated receiver or 3.5mm input
· Home Automation Control via IR, RS-232 and Ethernet (8x8 only)
· PC Setup and Configuration
· HDCP 2.0 Compliant
· CEC Compliant

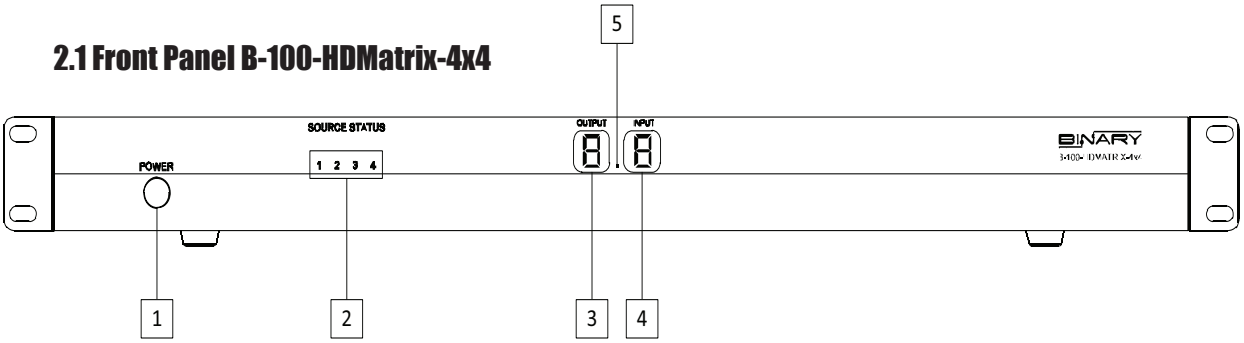
1.2 PACKAGE CONTENTS

(1) B-100-HDMATRIX-4x4 or B-100-HDMATRIX-8x8
(2) Rack ears for mounting
(1) IR Remote
(1) Power supply
- *B-100-HDMATRIX-4x4,* **5V 4A**
- *B-100-HDMATRIX-8x8,* **12V 5A**

(1) IR Adapter for Automation Systems
(1) User Manual
(1) CD Rom containing documentation and software

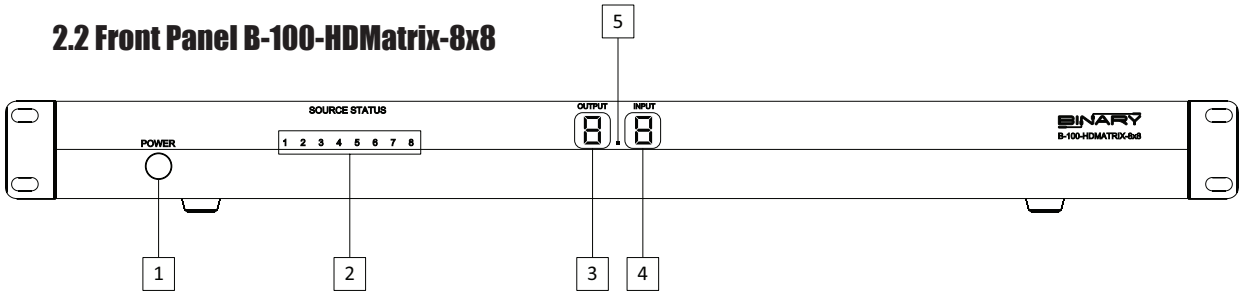
2. FRONT AND REAR PANEL

2.1 Front Panel B-100-HDMatrix-4x4



1. Power: Power ON/OFF switch
2. Source Status (LED on = Source is ON and sending a signal)
3. Output: Displays the last selected Output
4. Input: Displays the last selected Input
5. IR Receiver Window

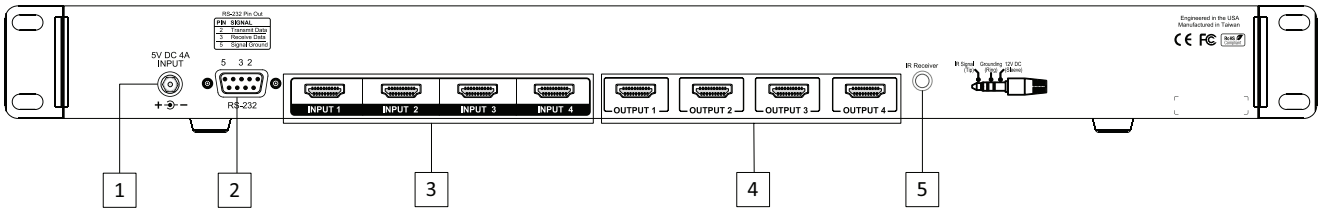
2.2 Front Panel B-100-HDMatrix-8x8



1. Power: Power ON/OFF switch
2. Source Status (LED on = Source is ON and sending a signal)
3. Output: Displays the last selected Output
4. Input: Displays the last selected Input
5. IR Receiver Window

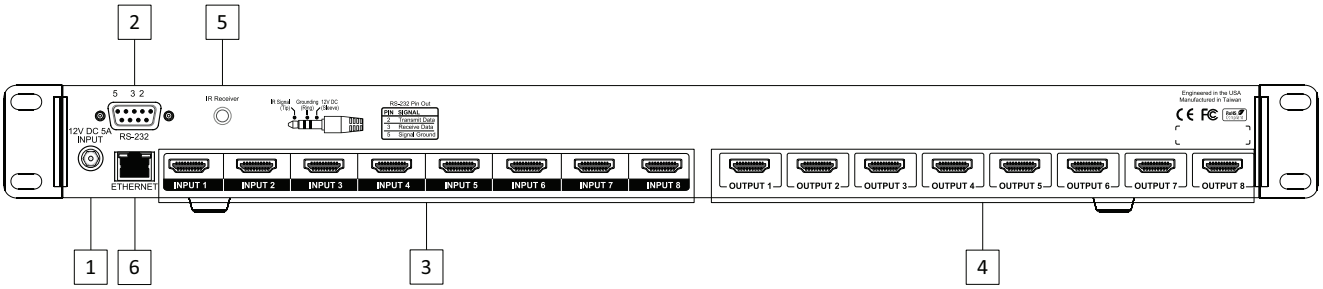
© 2011 Binary

2.3 Rear Panel B-100-HDMATRIX-4X4



1. +5V DC interlocked power jack
2. RS-232 control port (DB9)
3. HDMI Inputs 1 through 4
4. HDMI Outputs 1 through 4
5. External IR Receiver (3.5mm Stereo)

2.4 Rear Panel B-100-HDMATRIX-8x8



1. +12V DC interlocked power jack
2. RS-232 control port (DB9)
3. HDMI Inputs 1 through 8
4. HDMI Outputs 1 through 8
5. External IR Receiver (3.5mm Stereo)
6. Ethernet Port

3. INSTALLATION

3.1 Installation Considerations

Binary HDMatrix switchers are designed with unsurpassed technology to provide superior performance. However, where you install the switcher can have a large effect on the performance that you receive, and the life of the unit. Here are some guidelines to follow when installing a B-100- HDMatrix Switcher.

- Be sure that the unit is in a well-ventilated area that provides adequate cooling.
- Do not block the cooling vents located on both sides of the unit.
- Do not place the unit on carpeting or any similar material.
- Do not install the unit near a source of heat, or in an extremely humid or wet location.
- If your installation lacks good air flow (such as solid cabinet doors or wall-mounted racks), it may be necessary to create ventilation to allow outside air into the space.
- Allow a minimum of 3" of free air space on either side of the unit. (Does not apply to rack mounting)
- Allow a minimum of 2" of depth behind unit to accommodate cables and connectors.
- When placing on a cabinet shelf, position the unit with all feet resting on a solid level surface.

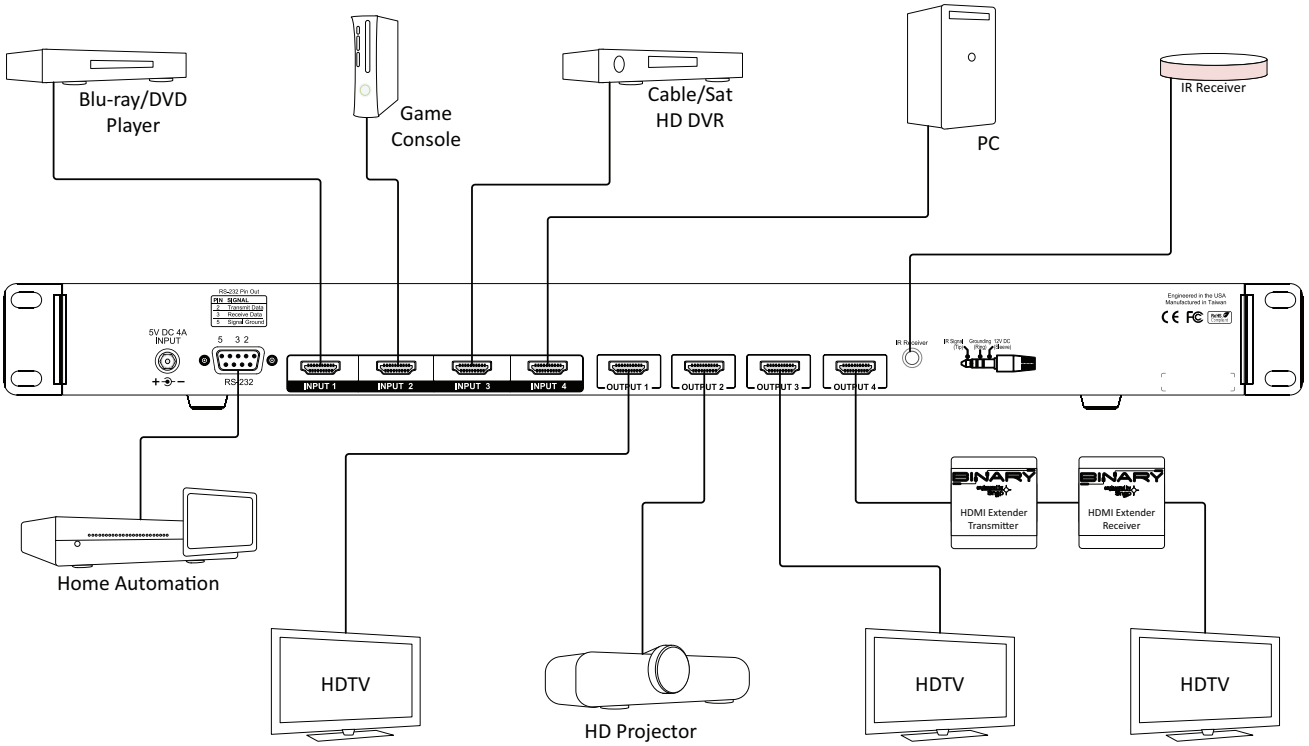
3.1.1 Rack Installation

The B-100-HDMATRIX can be mounted in a rack with the front or rear panel facing outward. This allows for easy access to the connections for installations that do not require the front panel of the unit to be accessed. When mounting the rear panel facing out, it is recommended that an IR receiver or Automation system is used.

© 2011 Binary

3.2 CONNECTIONS

3.2.1 Basic Connections



Examples

HDMI Sources

- Blu-ray /DVD Player
- Game Console
- Cable/Sat HD DVR
- PC

Video Displays

- HD Flat-Panel
- HD Projector
- HD Flat Panel
- HDMI Extender

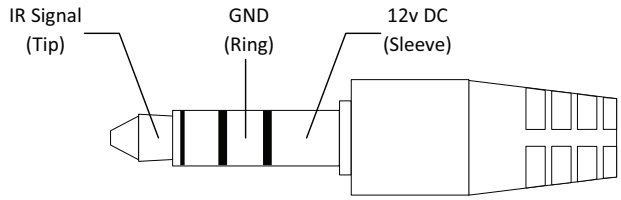
Control Devices

- IR Receiver
- Home Automation System

3.3 Control Ports

3.3.1 IR Receiver Connection

Pin out configurations for IR receivers and Automation Systems vary. Before connecting to this input, review this section carefully in order to match the pin outs for the HDMatrix. Before connecting an IR Receiver or to an IR Automation System, verify that the HDMatrix is OFF to ensure proper operation when connected.

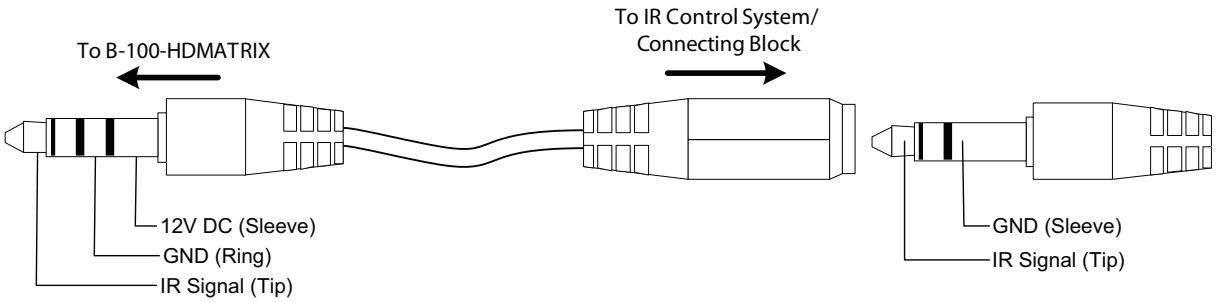


IR Signal	Tip
GND	Ring
12v DC	Sleeve

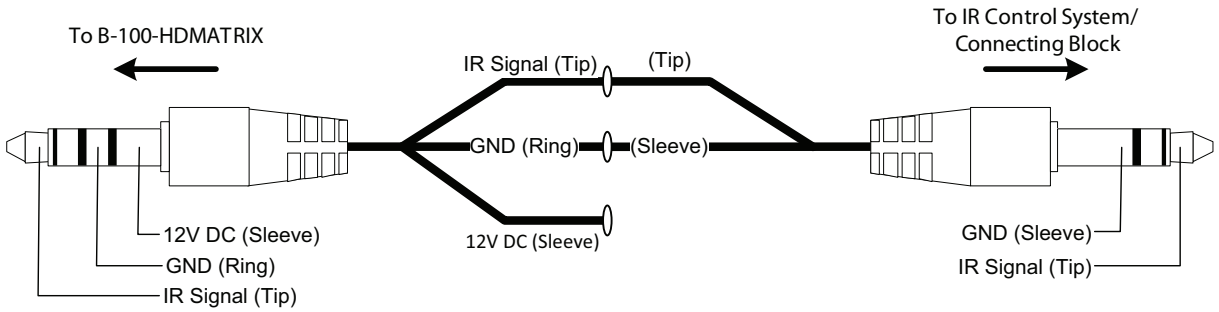
3.3.2 Connecting to an IR Automation System/Connecting block

When connecting to an IR Automation System or connecting block, the 12V DC (Sleeve) must not be connected. Connections of this type require the use of the included Stereo to Mono dongle or a custom cable made. A mono 3.5mm cable should not be used as it will short out the 12 VDC to GND, and will make the connection inoperable.

3.3.2.1 Stereo to Mono IR Adaptor



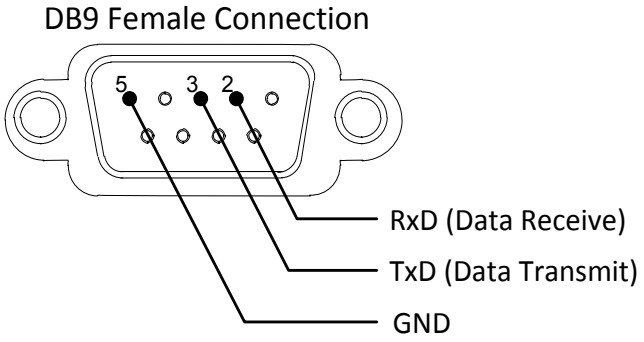
3.3.2.2 Custom Cable Construction



© 2011 Binary

3.3.3 RS-232 DB9 Serial Connection

The Binary™ HDMatrix receives control data on pin 2 (Rxd - Data Receive) and transmits control data on pin 3 (TxD - Data Transmit). The connection cable between the HD MATRIX and the Automation System will need to be configured so that pin2 (RxD) on the HD MATRIX is connected to the Automation Systems Txd pin, and pin3 (TxD) on the HD MATRIX is connected to the Automation Systems Rxd (Receive Data) pin. See below for details.
Configuration for the Automation System control ports can vary. Refer to the documentation for the Automation System you are using to ensure proper connection and configuration. This port is also used to communicate with a PC when using the PC Configuration Utility. Refer to the Configuration Utility manual for details.



PIN	FUNCTION
2	RxD (Data Receive)
3	TxD (Data Transmit)
5	GND

In addition to the RS-232 DB9, the B-100-HDMATRIX-8x8 adds an Ethernet port that can be used to control the device using Telnet Protocol. This port follows TIA 568 A/B standards; refer to these when creating wiring.

4 EDID Configuration

While most HDMI sources can provide full HD, the displays used within an installation may not support the features available from the source. In these cases, the display may not play the content being provided by the source. It is necessary to make sure each source will provide a Video and Audio format compatible with all displays that will view that source. This can be accomplished by managing the EDIDs stored in the HDMatrix for each source. The stored EDID is per source, so all display locations will see the same resolution and have the same audio format when that source is selected.

The following section explains configuring EDIDs via the IR Remote. Before configuring the EDID be sure to refer to the source(s) and display(s) manuals for available features and resolutions for each device.

While all EDID, configurations are available via the remote, a PC utility is also available on the HDMatrix product pages, which can be found on the manufacturer's website (www.snapav.com).

When configuring EDIDs via IR, the ENTER key must be pressed within 10 seconds of the last command in order to be processed.

Source Setup
Most sources have selections for Audio format and Video resolution that can fix the output so that it will not change based on the EDID supplied by the connected display or switch. Check each source and confirm that the audio format and video resolution are set so that they will change based on the EDID negotiation. Normally this is a setting called "Auto" or similar.

Display Setup
It is recommended that the Consumer Electronics Control (CEC) is turned OFF in all displays when using the HDMatrix. This will provide for proper communications of video/audio signals and allow EDIDs to function at their optimum performance. Refer to the display's manual for information on how to turn this function OFF.

Verify that all displays are connected to the HDMatrix before continuing with EDID Configuration.

4.1 Basic EDID Configuration

The quickest and easiest method for configuration is to use Auto EDID. When used, the HDMatrix looks at the EDID from each of the connected displays. It uses the lowest common denominator for video resolution and audio format to create a new EDID , which is saved to all Inputs.

Note: Auto EDID sets audio to 2ch for all inputs regardless of the capability of the connected displays. If multi-channel audio is desired, embedded EDIDs or Learned EDIDs will need to be used.

When to Use Auto EDID

- When all sources will be available on all displays.
- Every display in the system accepts the same video and audio resolution from the sources.
- As a first step to configuration following up with advanced methods for particular displays and dedicated sources.

For advanced EDID configuration when using legacy display and/or dedicated sources, use embedded EDIDs or learning as described in the following sections:

© 2011 Binary

Setting Auto EDID via IR Remote

Sets EDID Based on All Connected Displays	*Display Readout (Example)*
1. Press DEFAULT	E-
2. Press Number Key 9	AA
4. Press ENTER	A0

4.2 Advanced EDID Configuration

4.2.1 Embedded EDIDs Defaults

The B-100-HDMATRIX switchers contain 8 representative 'embedded' EDIDs that may be assigned to Inputs. These EDIDs define groups of video and audio capabilities that are useful for configuring sources in most systems.

When to Use Embedded EDIDs

- When audio and video characteristics of displays are known and compatible with the an Embedded EDID

Explanation of Embedded EDIDs

Video Resolution in the Embedded EDIDs is the **highest resolution** a connected source will output; for example, if the source is capable of 1080P@60, it will be required by EDIDs 1-6 to provide that resolution. However, if the source is only capable of 1080i, it will output 1080i, etc. It is assumed that any display that can accept the specified Video Resolution can also accept all standard video resolutions less than that specified.

Color Depth is the maximum number of bits used to encode color. 24bit color depth is 8bits per color (Red, Blue, Green) and 36bit color depth is 12 bits per color. When 36bit color is used, the bandwidth increases substantially. This will dramatically reduce the distance between the switch and the display when using an extender.

3D indicates that the source can output 3D if it is available in the content.

Audio Format indicates the maximum number of audio channels, as well as the audio format that the source is allowed to output. For an Embedded EDID with 7.1ch Audio Format, the source device will output the highest audio possible based on the content. For example, if 7.1ch is not available and 5.1ch is, the output will be 5.1ch. The same holds true if 2ch is the only audio available from the source.

Embedded EDIDs with 2Ch will limit output of the source to 2ch regardless of the formats available in the content.

Embedded EDIDs 7 and 8 are provided for legacy displays that can only accept resolutions up to a maximum of 1080i / 720p. The 1080i is listed first since almost all older HD displays can accept 1080i, but not all can accept 720p. For these two Embedded EDIDs, (7&8) the source will output 1080i. Should 1080i not be available, the source will output 720p. There is a possibility that 720p may not work for a very small number of displays currently in use. If you have such a display, you will need to use a Learned EDID (see below) from the display to store in the Input EDID of any sources that will be routed to that display.

Embedded EDID	Resolution	Color Depth	Audio
1	1080p@60Hz	24-Bit	7.1ch
2	1080p@60Hz	24-Bit	2ch
3	1080p@60Hz	24-Bit 3D	7.1ch
4	1080p @60Hz	24-Bit 3D	2ch
5	1080p@60Hz	36-Bit 3D	7.1ch
6	1080p@60Hz	36-Bit 3D	2ch
7	1080i@60Hz / 720p@60Hz	24-Bit	7.1ch
8	1080i@60Hz/ 720p@60Hz	24-Bit	2ch

4.2.1.1 Setting EDID for Single Input

Example: Input =1 Embedded EDID=4	*Display Readout (Example)*
1. Press DEFAULT	E-
2. Press Number Key (1-8) to select one Embedded EDID	4A
3. Press INPUT	4A
4. Press Number Key (1-8) to select the Input to which the EDID is applied	4 1
5. Press ENTER	-- (success) FF (fail)

4.2.1.2 Setting EDID for All Inputs

Example: Input=All Embedded EDID=4	*Display Readout (Example)*
1. Press DEFAULT	E-
2. Press ALL to select all Inputs	E-
3. Press Number Key (1-8) to select Embedded EDID	4A
4. Press ENTER	-- (success) FF (fail)

© 2011 Binary

4.2.2 Learning EDID

For more advanced EDID configuration, learning can be used to assign EDIDs. When used ,the EDID from a particular display is assigned to a particular source or all sources. This is useful when the system contains a display that may not output the highest resolution available from the sources.

When to Use Learned EDIDs

- An older display does not work properly with any of the embedded EDIDS.
- When the source is a PC, it may be necessary to use a learned EDID.
- Learning EDID to a Single Input.

Example: Input =1 EDID Learned from Output 4	*Display Readout (Example)*
1. Press LEARN	L.-.
2. Press OUTPUT	1A
3. Press Number key (1-8) to select the Output the EDID is learned from	14
4. Press INPUT	L-
5. Press Number Key (1-8) to select the Input to which the EDID is applied	1A
6. Press ENTER	-- (success) FF (fail)

4.2.2.1 Learning EDID to All Inputs

Note that learning the EDID for a display to all sources is the same as using Auto EDID.

Example: Input=All EDID Learned from Output 4	*Display Readout (Example)*
1. Press LEARN	L.-.
2. Press OUTPUT	
3. Press Number Key (1-8) to select the Output the EDID is learned from	4
4. Press ENTER	-- (success) FF (fail)

4.3 EDID Status

Once EDIDs are configured, the assigned EDID for sources can be reviewed to ensure that the desired output is configured or for troubleshooting.

Example: Input=3	Display Readout (Example)	
	EDID 5 Assigned from Embedded EDID Table	EDID Learned from Output 4
1. Press STATUS	- -	- -
2. Press INPUT	- -	- -
3. Press Number Key (1-8)to select the desired Input	-3	-3
4. Press ENTER	5.3.	4.3

- If the second digit (the Input being queried) has a dot after it, then the first digit is the EDID number from the Embedded EDID table.

- If the second digit (the Input being queried) does not have a dot after it, then the first digit is the Output the EDID was learned from.

5 Advanced Configuration

During the installation of an HDMatrix, there are settings that provide Advanced Configuration above the use of the remote. These allow for fine tuning the HDMatrix when used under certain conditions and the settings listed below are not available from the remote.

For more information refer to the Configuration Utility manual available on the SnapAV website

5.1 PC Configuration Other Settings

The following settings can be found in the PC Configuration Utility Other Settings menu.

5.1.1 IR Receiver Active

Use this setting to disable the front panel IR receiver to avoid IR command conflicts and prevent IR flooding of the HDMatrix. When IR is disabled, RS232 or IP must be used to control the HDMatrix.

5.1.2 Front Panel Power Button Active

Use this feature to disable/Enable the front panel power button of the HDMatrix when using an Automation System. This will prevent the HDMatrix from being powered OFF and preventing control of the device from an automation system UI.

5.1.3 HDMI Input EQ Setting

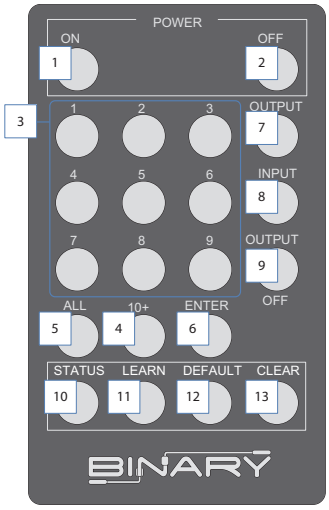
Use these settings when an HDMI image contains video noise and artifacts that can occur during switching or viewing some HDMI sources or displays. Each input can be set to High when video noise is present. We recommend that this be set to LOW as a starting point, and only changed should video noise be present on a particular input.

© 2011 Binary

6 OPERATION AND CONTROL

6.1 IR Remote

	Key	Function
1	ON	Power on the matrix switcher
2	OFF	Enter standby mode
3	Number Keys 1-9	Select a number
4	10+	Not Used
5	All	Select all Inputs or Outputs
6	Enter*	Enter to trigger the previous setting
7	OUTPUT	Begin output selection
8	INPUT	Begin input selection
9	OUTPUT OFF	Turn off/Mute the selected Output
10	STATUS	Present EDID or Output status
11	LEARN	Learn EDID from one output
12	DEFAULT	Begin Embedded EDID Selection
13	CLEAR	Clear the former IR operation procedure which user just pressed but has not yet applied by pressing ENTER



**The ENTER key must be pressed within 10 seconds of the last command in order to be processed.*

6.1.1 Route Inputs to Outputs

Input to Single Output Example: Output=3 Input=4	*Display Readout (Example)*
1. Press OUTPUT	--
2. Press Number Key (1-8) to select Output	3-
3. Press INPUT	3-
4.Press Number Key (1-8) to select Input	34
5. Press ENTER	34

Input to All Outputs Example: Output=All Input=4	*Display Readout (Example)*
1. Press OUTPUT	--
2. Press ALL to select all Outputs	A-
3. Press INPUT	A-
4. Press Number Key (1-8) to select Input	A4
6. Press ENTER	44

6.1.2 Turn Off (Mute) Outputs

Mute one Output Example: Output=1	*Display Readout (Example)*
1. Press OUTPUT	- -
2. Press Number Key (1-8) to select Output	1-
3. Press OUTPUT OFF	10
4. Press ENTER	10

Mute All Outputs	*Display Readout (Example)*
1. Press OUTPUT	- -
2. Press ALL to select All Outputs	A-
3. Press OUTPUT OFF	A0
4. Press ENTER	40

6.1.3 Display Status

Example: Input=3	Display Readout (Example)	
	Example Output=3, Input=4	Example Output=3 Muted
1. Press STATUS	- -	- -
2. Press OUTPUT	- -	- -
3. Press Number Key (1-8) to select one Output	3-	3-
4. Press ENTER	34	30

6.1.4 Resetting to Factory Defaults

This procedure resets the B-100-HDMATRIX to factory defaults:
EDIDs - 1080i Stereo (embedded 8), I/O - All Outputs set to Input 1, DHCP (8x8 only) - Enabled.

	Display Readout (Example)
1. Press DEFAULT	E-
2. Press DEFAULT	- -
3. Press DEFAULT	- -
4. Press DEFAULT	dd
5. Press ENTER	d-

Note that resetting factory defaults can take up to 2 minutes to complete.

© 2011 Binary

7. SPECIFICATIONS

		B-100-HDMATRIX-4x4	B-100-HDMATRIX-8x8
Technical			
Product Type		True 4x4 HDMI matrix	True 8x8 HDMI matrix
HDMI compliance		Full HD 1080P60, Deep Color (36bit), 3D (1.4a 3D)	Full HD 1080P60, Deep Color (36bit), 3D (1.4a 3D)
HDCP compliance		Version 2.0	Version 2.0
Video bandwidth		Single-link 225MHz [6.75Gbps total bandwidth]	Single-link 225MHz [6.75Gbps total bandwidth]
Video support		1080p / 1080i / 720p /480p / 480i up to 36-bit color	1080p / 1080i / 720p /480p / 480i up to 36-bit color
Audio support		Multi-Channel up to 7.1: Dolby TrueHD Dolby Digital Plus DTS-HD Master DTS-HD LPCM Dolby Digital EX DTS-ES Dolby Digital DTS 2ch: PCM	Multi-Channel up to 7.1: Dolby TrueHD Dolby Digital Plus DTS-HD Master DTS-HD LPCM Dolby Digital EX DTS-ES Dolby Digital DTS 2ch: PCM
ESD protection		ESD: IEC 61000-4-2 Level 4 (15KV) Surge: IEC 61000-4-5	ESD: IEC 61000-4-2 Level 4 (15KV) Surge: IEC 61000-4-5
Input		4x HDMI 1x RS-232 1x System IR (3.5mm jack)	8x HDMI 1x RS-232 1x System IR (3.5mm jack) 1x Ethernet Port
Output		4x HDMI	8x HDMI
HDMI Input selection		IR remote or RS-232	IR remote, RS-232 or Ethernet
IR remote control		21 button remote for Setup and Operation	21 button remote for Setup and Operation
HDMI connector		Type A [19-pin female]	Type A [19-pin female]
RS-232 connector		9-pin DB9 female	9-pin DB9 female
Ethernet Connector		N/A	RJ45
Mechanical			
HousingV		Metal enclosure	Metal enclosure
Dimensions (W x H x D)	Switcher	17.31” x 1.75” x 5.25”	17.31” x 1.75” x 6.5”
	Package	21” x 3.1” x 10.4”	21” x 3.1” x 10.4”
Weight		4.4 lbs	5.4 lbs
Mounting		1RU rack-mount. Ears included	1RU rack-mount. Ears included
Power supply		5V 4A DC	12V 5A DC
Power consumption		20 Watts [max]	60 Watts [max]
Operation temperature		32~104°F]	32~104°F]
Storage temperature		-20~60°C -4~140°F	-20~60°C -4~140°F
Relative humidity		20~90% RH [no condensation]	20~90% RH [no condensation]

8. WARRANTY

Two-Year Limited Warranty
This Binary™ product has a 2-year limited Warranty. This warranty includes parts and labor repairs on all components found to be defective in material or workmanship under normal conditions of use. This warranty shall not apply to products which have been abused, modified or disassembled. Products to be repaired under this warranty must be returned to SnapAV® or a designated service center with prior notification and an assigned return authorization number (RA).

© 2011 Binary

BINARY

engineered by Snap av

© 2011 Binary

140407-1100